

Serial No. 10/053,434

REMARKS

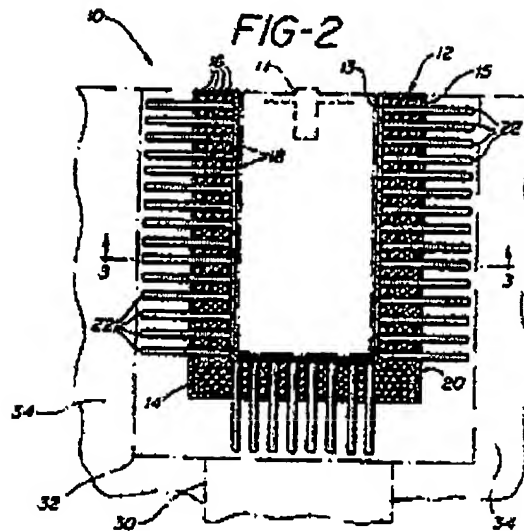
In the Office Action mailed May 27, 2005, the Examiner rejected all pending claims 1, 3-7, 11 and 14. Claims 1, 6, 7 have been amended. Claims 3 and 14 have been canceled without prejudice. Claims 2, 8-10, 12, 13 and 15 were previously withdrawn from consideration in connection with a restriction requirement. Claims 1, 4-7, and 11 remain pending in the application (1 independent, 6 total). No new matter has been added. Reconsideration is respectfully requested in light of the following Remarks.

A. Claim Rejections – 35 U.S.C. § 102

The Examiner maintains the Section 102 rejection of claims 1, 3-7, 11, and 14 based on U.S. Patent No. 5,000,252, issued to Faghri (the "Faghri reference," or simply "Faghri"). This rejection is respectfully traversed in light of the claims as amended.

The Examiner argues that Faghri discloses a phase change material in the form of shells 16 (see Figure 2 of Faghri below) and that this constitutes the heat storage subsystem of the present claims. The Examiner also argues that the storage subsystem is "remotely disposed" because this only requires that the elements be "some distance apart." Applicants disagree for the reasons set forth in the previous Response. Furthermore, the present claim amendments further distinguish the present invention of Faghri.

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Faghri reference, Fig. 2

As previously mentioned, the Faghri reference generally relates to a thermal management system including a number of heat pipes extending radially outward from a heat source. Specifically, a heat source 11 is surrounded by a container 12 and heat sink 14. A number of heat pipes 22 extend outward, and may communicate with an "ultimate heat sink" 34. Heat sink 14 includes a number of "shells" 16 immersed in a bath of thermally conductive material 20. The radial temperature drop across container 12 is reduced, and the surface of wall 13 near heat source 11 is maintained at a reasonable temperature. Heat pipes 22 can transfer heat to "ultimate heat sink" 34 during a burst period. In contrast, the present invention relates to a thermal management system wherein the heat input is subject to transient conditions, and wherein the novel configuration of elements allows these transient thermal events to be effectively managed.

The present invention adds greater flexibility in designing thermal solutions for applications subject to transient conditions in which space is a premium -- that is, in situations where fins or other such components will not fit in an area immediately adjacent to the heat source. Generally, a phase change heat storage subsystem and heat sink (or other such heat rejection subsystem) are remotely located from the heat source in a location where space is not

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such a premium. The heat source and heat storage unit are connected, for example, via a heat pipe.

Excess heat load generated during transient conditions is temporarily absorbed by the heat storage subsystem, which is remotely located from the heat source, and subsequently, the absorbed heat can be released back to the ambient via a heat rejection subsystem. The independent claim, to clarify this functionality, has been amended to include the limitation that heat reservoir has space constraints defined by a first volume of available space surrounding the component, and wherein the heat rejection subsystem and heat storage system have a combined volume that is greater than the first volume of available space.

The Faghri reference does not achieve these goals, as its heat storage system is adjacent to the heat source (not physically located outside the volume of available space surrounding the heat source, as called for in the amended claims). Faghri does not contemplate space limitations, and therefore is not concerned, and does not teach, a system where heat is transferred (via a heat pipe or the like) to a separate location for storage and heat rejection.

Furthermore, as noted before, the "ultimate heat sink" 34 of Faghri is not analogous to the heat storage subsystem of the present invention (which the Examiner associated with item 14), as it does not include the claimed phase-change feature.

In summary, the system disclosed by Faghri is structurally and functionally different from the present invention as recited in the amended claims. Applicants therefore respectfully request that the Section 102 rejections be withdrawn.

B. Conclusion

In view of the above remarks and amendments, Applicants respectfully submit that all of the currently pending claims properly set forth that which Applicants regard as their invention and are allowable over the cited prior art.

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Accordingly, Applicants respectfully request reconsideration and allowance of all pending claims. The Examiner is invited to telephone the undersigned at (602) 382-6325 at the Examiner's convenience, if that would help further prosecution of the subject Application. Applicants authorize and respectfully request that any fees due be charged to Deposit Account No. 19-2814, for which purpose a duplicate copy of this sheet is attached. This statement does NOT authorize charge of the issue fee.

Respectfully submitted,

Dated: 7/27/05By: 

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